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(54) Title: ADHESIVE TAPES

(57) Abstract: There is disclosed a masking tape having adhesive on both faces adapted to be spooled without an intervening release layer by the adhesive on one face being, when spooled, against an area of the other face to which it does not adhere.

ADHESIVE TAPES

This invention relates to adhesive tapes.

Tapes having adhesive on both faces are used for a variety of purposes, including masking for painting. When spooled the turns are interleaved with a release layer which is discarded on use.

The present invention provides, in one aspect, an improved double-sided adhesive tape.

The invention comprises, in one aspect, a masking tape having adhesive on both faces adapted to be spooled without an intervening release layer by the adhesive on one face being, when spooled, against an area of the other face to which it does not adhere.

The masking tapemay have adhesive on both faces with non-adhesive areas so arranged that when the tape is spooled the adhesive on each face is against a non-adhesive area of the other.

The adhesive may be in lengthwise stripes. Half or less than half of each face may be adhesive. There may be only one adhesive area on each face, but there may be two (or more) adhesive areas on one face, separated by a non-adhesive area. Each of the two adhesive areas may extend from the edges of the tape.

There may be two adhesive areas on each face of the tape, one of which, on each face, extends from an edge of the tape.

The non-adhesive areas will need to be coated with a release liner, so that on the spool they do not migrate between surfaces.

The tape may be stiff and resilient against transverse flexure and have at least one lengthwise fold line, which may comprise a slit, and which may be in an area which is adhesive or beneath an area which is adhesive.

The adhesive may be in lengthwise-extending blocks separated by non-adhesive areas - adjacent adhesive and non-adhesive areas may be the same length. The block length may vary from inside to outside of a spool to compensate for the varying circumference.

The invention provides, in another aspect, an adhesive tape, which may be single- or double-sided, which has advantages over conventional tape when used for masking, sealing or marking out.

The invention, in this aspect, comprises a graduated tape.

The tape may have graduation markings of different lengths, and may have different markings on its two faces. The markings may be in visible adhesive. Different markings may be colour coded.

The markings may be simple divisions of the tape, without numerals, or may be repetitive, for example, 2,4,6,8,0 for two centimetre divisions, there being little point in marking up an entire spool of tape when a fresh "zero" is created every time a length is used.

Generally, the advantage will be in being able to tear, or cut off, more or less precise lengths of tape for any particular purpose. However, an adhesive, sacrificial tape may be used for measuring perimeters, say, of rooms for estimating for tiling, wallpaper and so forth or for single-handed measurement of awkward shapes, the adhesive, in such cases, being of the releasable type found, for example, on 3M Post-it® notes.

In the case of double-sided adhesive and masking tape, the graduations facilitate tearing or cutting off a required length when it is not possible to fix one end and measure against the job in hand.

In another aspect, the invention provides a reduced cost, double-sided adhesive tape having extended utility.

The invention, in this aspect, comprises an adhesive tape having adhesive on both faces, one face being incompletely covered with adhesive and having a release layer over its adhesive. As before, a release liner coating on the uncovered area prevents migration of adhesive between contacting faces on the roll.

Such a tape can be used as a masking tape, and may be used to attach as a masking tape to an edge of a panel to be masked, a separate masking sheet being adhesively attached to the incompletely covered face after removal of the release layer.

The tape, as before, may be stiff and resilient against transverse flexure and may then have at least one fold line. The fold line may be laterally offset from the incomplete adhesive cover of the said one face and permit folding of the tape into an L-section with the adhesive of the said one face being on the back of the L-upright.

The tape may be divided lengthwise into a first part which is stiff and resilient against transverse flexure and a second part which is relatively flexible and less resilient as compared to the first part, said second part on one face being adhesive while said first part is not.

Any of the tapes of the invention in any of its aspects may have an adhesive free narrow lifting strip at an adhesive edge.

Embodiments of adhesive tapes according to the invention will now be described with reference to the accompanying drawings, in which :-

Figure 1 is a face-on view of a first embodiment of masking tape;

Figure 2 is a diagrammatic cross-section of the masking tape of Figure 1;

Figure 3 is a face-on view of a second embodiment of masking tape;

Figure 4 is a face-on view of a third embodiment of masking tape;

Figure 5 is a face-on view of a fourth embodiment of masking tape;

Figure 6 is a diagrammatic cross-section of the masking tape of Figure 5;

Figure 7 is a face-on view of a fifth embodiment of masking tape;

Figure 8 is a diagrammatic lengthwise section of the masking tape of Figure 7;

Figure 9 is a face-on view of a graduated tape;

Figure 10 is a face-on view of an embodiment of a double-sided tape with a release layer over part of the adhesive;

Figure 11 is a diagrammatic cross-section of the tape of Figure 10;

Figure 12 is a diagrammatic perspective view of the tape of Figures 10 and 11, being applied for masking a panel during spraying;

Figure 13 is a view like Figure 12 of a second stage in the masking operation;

Figure 14 is a diagrammatic cross-section of another embodiment of a tape like that of Figures 10 to 13;

Figure 15 is a diagrammatic cross-section showing the tape of Figure 14 used in masking a carpet for skirting-board painting; and

Figure 16 is a diagrammatic illustration of a method for manufacturing tape as illustrated in Figures 1 to 15.

Figures 1 to 15 illustrate adhesive or masking tape 11 which has, or can have, adhesive 12 on both faces 11a,11b with non-adhesive areas 13 so arranged that

when the tape 11 is spooled the adhesive 12 of one face, 11a,11b, is against a non-adhesive area.

Thus, a double-sided adhesive tape can be spooled without the need to interleave with a release layer.

As is usual, with the non-adhesive back of single-sided tapes, the non-adhesive areas will be coated with a release coating so that the adhesive will be easily separated from the non-adhesive areas on unspooling.

The adhesive 12 is, in Figures 1 to 6 and 10 to 15, in lengthwise stripes.

Figures 1 and 2 illustrate tape in which half of each face is adhesive, but the adhesive on one or both faces may cover less than half the width. There is only one adhesive area on each face in the embodiments of Figures 1, 2, 5, 6, 10, 11 and 14. In the tape of Figure 3, there are two adhesive areas on one face 11a, one on the other face 11b, while in Figure 4, there are two adhesive areas 12 on each face, the two adhesive areas 12 being separated by a non-adhesive area 13.

At least one of the adhesive areas 12 extends from an edge of the tape 11, but, as illustrated in Figures 3, 4 and 5, a thin, say 1-2 mm, strip 15 can be left free of adhesive right at the edge of the tape 11 to facilitate lift-off, whether from the spool or from a surface to which the tape 11 is temporarily adhered.

The tape may be flexible in the fashion of conventional masking or adhesive tape, or it may be relatively stiff so that it is resiliently flexible when bent on a lengthwise-extending line, in which case it may have at least one lengthwise fold line 16 as seen particularly in the embodiment of Figures 5 and 6, which is a slit, or it could be

a line of perforations, enabling the tape to be bent into an L-shape (dashed line, Figure 6) useful for masking carpet for painting skirting boards, for example, or even to be bent right back on itself, for masking rubber trim around windows and windshields on automobiles.

As seen in Figure 6, the fold line 16 is in an area 12 which is adhesive, but it might also be beneath such an area, i.e. in most cases, in an area 13 free of adhesive.

Figures 7 and 8 illustrate tape 11 in which the adhesive 12 is in lengthwise-extending blocks separated by non-adhesive blocks 13. Adjacent adhesive and non-adhesive blocks may be the same length, in which case the length has to be carefully controlled in relation to the diameter of the spool on which it is being wound, which increases, of course, as the tape is wound on it. An adhesive printing arrangement controlled by a feedback arrangement sensing spool diameter could clearly be used to make such a tape.

On the other hand, if the adhesive areas are shorter than the non-adhesive areas, and if the spool is wound on a large radius former with a relatively small radial difference between inside and outside turns of tape on the spool, it could be arranged that adhesive would never lie against adhesive, or so rarely as would be of small account.

Figure 9 illustrates a graduated adhesive tape 11. It appears to be contrary to reason that an adhesive tape which is designed to be cut or torn off in lengths from a spool should be graduated, since each time a length of tape is taken off the spool, a new zero is created. Nevertheless, the present inventor has envisaged multiple uses for such a tape.

For example, a "coarsely" graduated tape, which merely had graduation marks every inch, or every foot, or yard, or centimetre, decimetre or metre, might well be useful in masking, for example, where approximate lengths may need to be torn off from a roll - the graduations may help in tearing off the desired length, rather than one too short, which might be scrapped, or one too long, part of which might be scrapped.

It is not necessary to print numerals on the tape, but it would not be difficult to do so; such numerals might well be repetitive, for example 1 to 10 in centimetres or 1 to 12 in inches, and, of course, a tape may have graduation markings in both Imperial and metric units, both on one side (as in Figure 9) or on opposite sides, and they may be colour coded. The markings can be made in visible adhesive and Imperial units (IMP) can be on one half of one face, the other half being non-adhesive, with metric (M) units on the back of the non-adhesive part.

Figures 10 and 11 illustrate a tape which, while being double-sided and having, on the spool, adhesive 12 of one face against a non-adhesive part 13 of the other face, also utilises a release layer 21 over the adhesive 12 of one face. A use for such a tape is illustrated in Figures 12 and 13, which show the tape 11 applied at the edge of a panel 22 to be masked while an adjacent panel 23 is to be painted. The release layer 21 facilitates application of the tape by being non-adhesive. After application, the release layer 21 is pulled away to expose adhesive to which a sheet 24 (Figure 13) can be stuck.

In a particular way of using this tape, the rim of the panel to be masked has the tape applied all round and the release layer 21 removed. A sheet 24, larger than the panel 22, is pressed on to the exposed adhesive, then the sheet 24 is trimmed down to size using, for example, an envelope slitting device. This substantially reduces the time taken to mask a panel.

A similar arrangement, using stiff tape with a lengthwise fold line 16, is shown in Figures 14 and 15, which, although double-sided, is easy to use for masking a carpet 25 while painting a skirting board 26, the adhesive 12 of side 11b of the tape 11 being attached to the edge of the carpet 25, the tape 11 then being bent on the fold line 16 to lie flat on the carpet face, the release layer 21 then being removed to expose the upper adhesive 12 on face 11a for attachment of a dust sheet 24.

Figure 16 illustrates a method for making tapes according to the invention described above.

A tape 11 is unwound from a spool 161 by feed rollers 162 then printed on face 11a with a release coating 163 at a first printing head 164, then printed on face 11b with a release coating 163 at a second printing head 165. The face 11b is then coated, in between the areas to which the release coating 163 has been applied, with a contact or pressure adhesive 166 at a coating head 167, and the face 11a is then coated with the adhesive 166 at a second coating head 168.

With a suitable choice of release coating 163 and adhesive 166 it may be possible to apply the adhesive over the whole area of the tape, it attaching only to the areas not printed with the release coating 163.

A release layer 21, if required, can be added from spool 169 just prior to winding the finished tape 11 on to a spool 170.

CLAIMS

1. A masking tape having adhesive on both faces adapted to be spooled without an intervening release layer by the adhesive on one face being, when spooled, against an area of the other face to which it does not adhere.

2. A masking tape according to claim 2, with non-adhesive areas so arranged that when the tape is spooled the adhesive of one face is against a non-adhesive area of the other.

3. A tape according to claim 1 or claim 2, in which the adhesive is in lengthwise stripes.

4. A tape according to any one of claims 1 to 3, in which half of each face is adhesive.

5. A tape according to any one claims 1 to 3,, in which less than half of each face is adhesive.

6. A tape according to any one of claims 1 to 5, in which there is only one adhesive area on each face.

7 A tape according to any one of claims 1 to 5, in which there are two adhesive areas on one face, separated by a non-adhesive area.

8. A tape according to claim 7, in which each of the two adhesive areas extends from the edges of the tape.

9. A tape according to claim 7, in which there are two adhesive areas on each face, one of which, on each face, extends from an edge of the tape.

10. A tape according to any one of claims 1 to 7, which is stiff and resilient against transverse flexure and has at least one lengthwise fold line.

11. A tape according to claim 10, in which the fold line comprises a slit.

12. A tape according to claim 10 or claim 11, in which the fold line is in an area which is adhesive or beneath an area which is adhesive.

13. A tape according to any one of claims 1 to 12, in which the adhesive is in lengthwise-extending blocks separated by non-adhesive areas.

14. A tape according to claim 13, in which adjacent adhesive and non-adhesive areas are the same length.

15. A spool of tape according to claim 14, in which the block length varies from inside to outside of the spool.

16. A graduated adhesive tape.

17. An adhesive tape according to claim 16, having graduation markings of different unit lengths.

18. An adhesive tape according to claim 17, having both Imperial and metric markings.

19. An adhesive tape according to claim 17 or claim 18, having different markings on its two faces.

20. An adhesive tape according to any one of claims 16 to 19, in which the markings are in visible adhesive.

21. An adhesive tape according to any one of claims 16 to 20, in which the markings are coloured.

22. An adhesive tape according to claim 21, in which different markings are colour coded.

23. An adhesive tape according to any one of claims 18 to 22, being a masking tape.

24. An adhesive tape according to claim 23, being a masking tape according to any one of claims 1 to 14.

25. An adhesive tape having adhesive on both faces, one face being incompletely covered with adhesive and having a release layer over its adhesive.

26. An adhesive tape according to claim 25, when used as a masking tape.

27. An adhesive tape according to claim 25 or claim 26, when used to attach as a masking tape to mask an edge of a panel to be masked, a separate masking sheet being adhesively attached to the incompletely covered face after removal of the release layer.

28. An adhesive tape according to any one of claims 25 to 27, being stiff and resilient against transverse flexure and having at least one transverse fold line.

29. An adhesive tape according to claim 28, in which the fold line is laterally offset from the incomplete adhesive cover of the said one face and permits folding of the tape into an L-section with the adhesive of the said one face being on the back of the L-upright.

30. An adhesive tape according to any one of claims 25 to 27, being divided lengthwise into a first part which is stiff and resilient against transverse flexure and a second part which is relatively flexible and less resilient as compared to the first part, said second part on one face being adhesive while said first part is not.

31. A tape according to any one of claims 1 to 30, having an adhesive free narrow lifting strip at an adhesive edge.

32. A method for masking an area from treatment of a surrounding area comprising the steps of :

masking the perimeter of the area using double-sided masking tape;

placing over the area a protective sheet which adheres to the adhesive on the outer face of the tape;

trimming the sheet where necessary to expose surrounding area for treatment.

33. A method according to claim 32, using tape according to any one of claims 1 to 31.

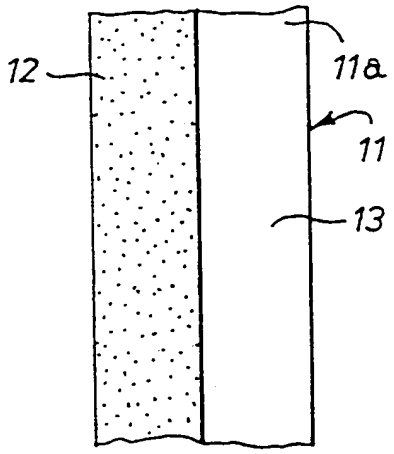

FIG.1

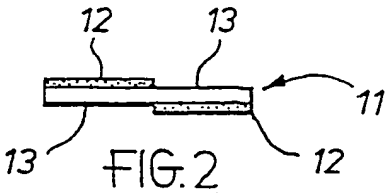

FIG.2

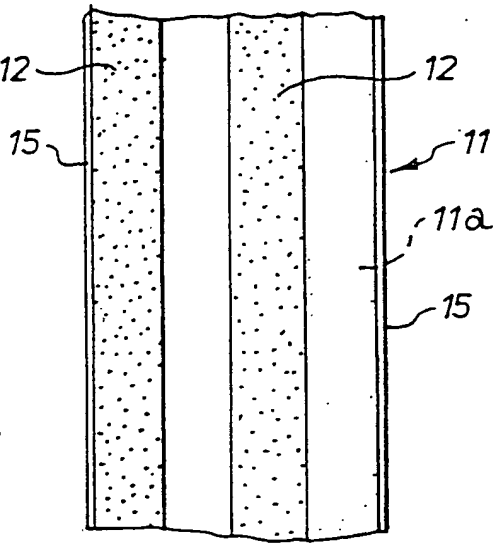

FIG.4

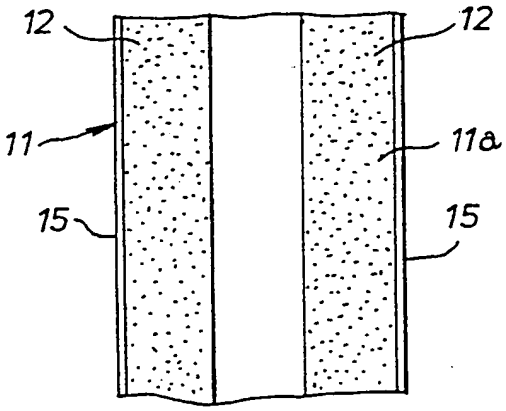

FIG.3

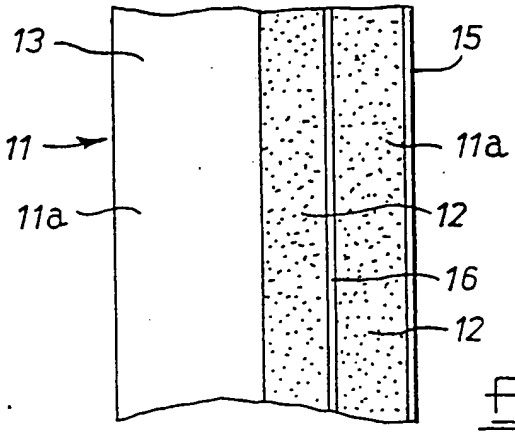

FIG.5

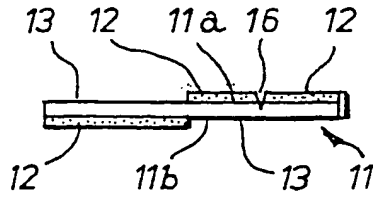

FIG.6

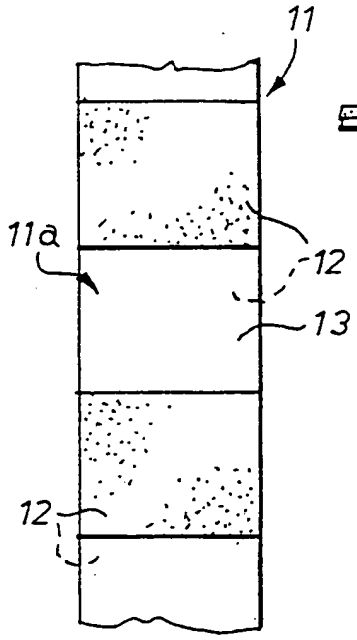

FIG.7

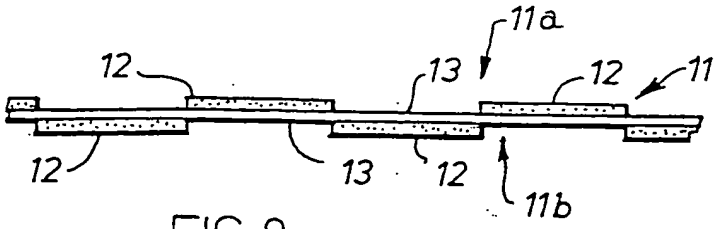

FIG.8

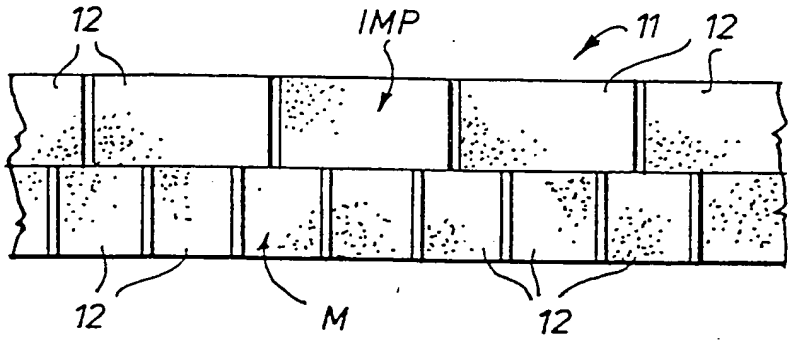

FIG.9

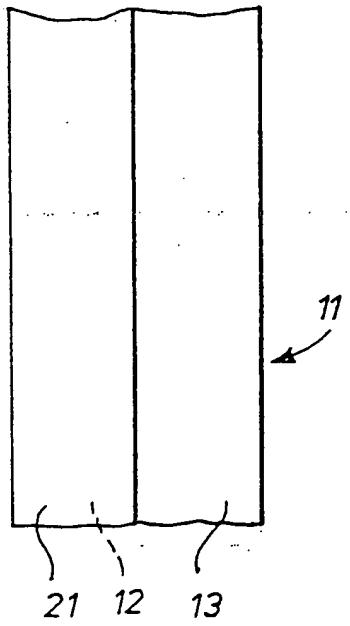

FIG.10

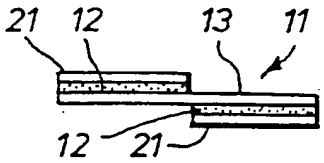

FIG.11

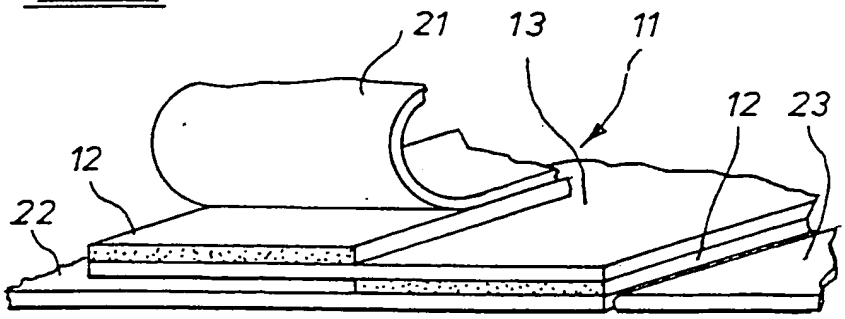

FIG.12

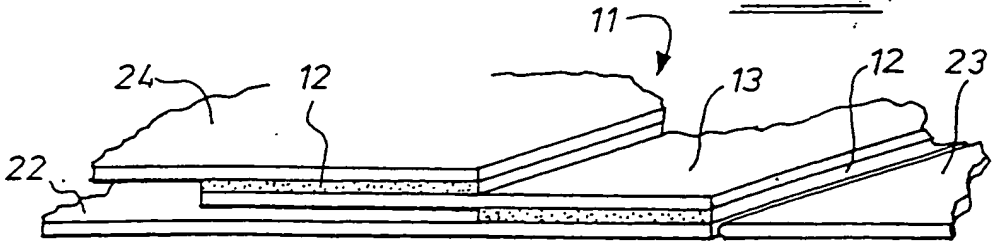

FIG.13

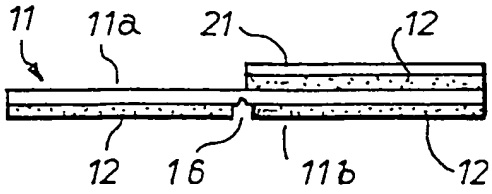

FIG. 14

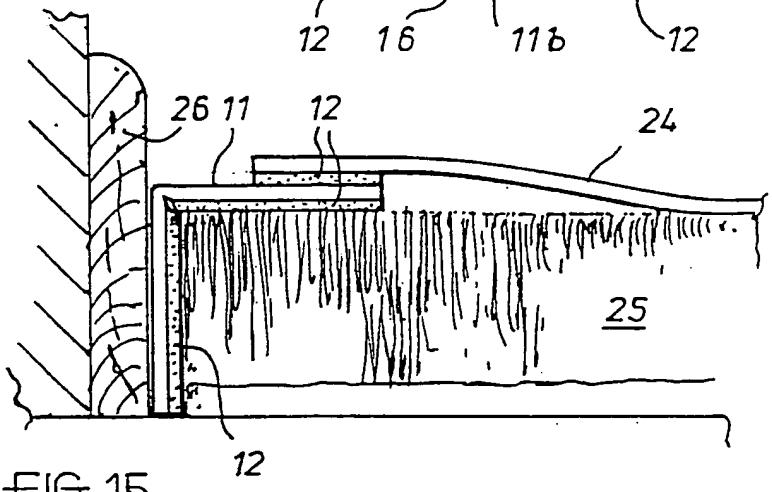

FIG. 15

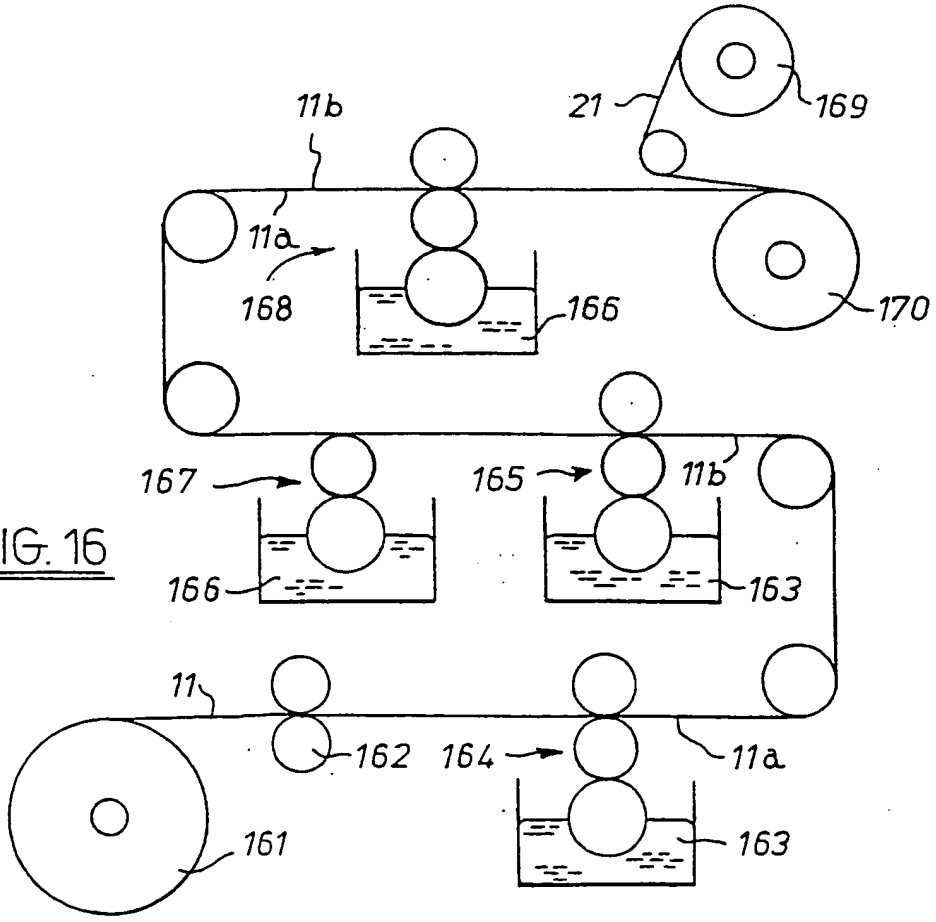

FIG. 16